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THE PLANT DISEASE REPORTER

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Division of Mycology and Disease Survey

Volume XXIII **Number 11**

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BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE PLANT DISEASE REPORTER

Issued by

THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Volume XXIII June 15, 1939 Number 11

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E. G. Kelsheimer, L. M. Fenner, C. E. Dike, and Curtis May have compiled a table showing the total number of elm specimens cultured from 1930 to 1938, and the percentage yielding Ceratostomella ulmi, page 182.

John C. Dunegan reports that the death of peach trees in the Nashville district of Arkansas is evidently caused by winter injury, page 184.

Reports on various fruit diseases include, on page 186, the development of apple scab; on page 188, reports on fire blight and notes on the cedar rusts; on page 189, reports on peach diseases; on page 190, cherry diseases including bacterial gummosis in New York, and black-rot leaf spot on apple, red-core disease of strawberry, and blackberry orange rust.

In Kentucky tobacco blue mold appeared first in old plant beds, according to W. D. Valleau, page 191. E. M. Johnson reports that the bacterial leaf spots have been destructive in western Kentucky, page 192. Sun scald was locally serious in North Carolina according to O. P. Owens, page 193.

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Wheat leaf rust overwintered in New York according to Karl D. Butler reporting on cereal diseases in that State, page 197.

W. D. Valleau reports wheat leaf rust as unsually severe in western Kentucky, page 198. Loose smut is unsually prevalent on wheat in both Oklahoma and Kansas, according to K. Starr Chester and to C. O. Johnston.

P. A. Ark and E. W. Bodine report that bacterial ring rot appeared in severe form in one of the important potato shipping areas of California, page 199.

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May weather, page 201

Elm specimens cultured and percentages yielding Ceratostomella ulmi, 1930 to 1938

State	1930		1931		1932		1933		1934		1935		1936		1937		1938		Total spec. cult.	% C.u.
	Spec. cult.	% C.u.	Spec. cult.	% C.u.	Spec. cult.	% C.u.	Spec. cult.	% C.u.	Spec. cult.	% C.u.	Spec. cult.	% C.u.	Spec. cult.	% C.u.	Spec. cult.	% C.u.	Spec. cult.	% C.u.		
Alabama	0	-	0	-	0	-	0	-	7	0	0	-	2	0	4	0	20	0	33	0
Arizona	0	-	0	-	0	-	0	-	0	-	0	-	0	-	4	0	0	-	4	0
Arkansas	0	-	2	0	0	-	1	0	0	-	0	-	2	0	3	0	5	0	13	0
California	0	-	2	0	0	-	0	-	3	0	0	-	0	-	0	-	0	-	5	0
Colorado	0	-	0	-	3	0	0	-	4	0	3	0	0	-	0	-	0	-	10	0
Connecticut	1	0	2	0	4	0	72	1.4	2015	2.8	9810	.8	11705	.9	7752	1.6	10898	4.9	42259	2.1
Delaware	0	-	0	-	0	-	4	0	5	0	4	0	13	0	1	0	5	0	32	0
Florida	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
Georgia	0	-	0	-	0	-	1	0	1	0	0	-	2	0	1	0	7	0	12	0
Idaho	0	-	0	-	0	-	1	0	0	-	0	-	0	-	0	-	0	-	1	0
Illinois	5	0	19	0	5	0	10	0	18	0	215	0	425	0	79	0	40	0	816	0
Indiana	3	0	4	0	3	0	5	0	73	5.5	140	7.1	198	9.6	3190	1.0	7908	.4	11524	.9
Iowa	0	-	1	0	4	0	55	0	5	0	7	0	4	0	5	0	4	0	85	0
Kansas	0	-	0	-	2	0	2	0	4	0	0	-	0	-	1	0	3	0	12	0
Kentucky	0	-	1	0	2	0	10	0	18	0	75	0	71	0	76	0	282	0	535	0
Louisiana	0	-	0	-	0	-	5	0	5	0	13	0	12	0	1	0	1	0	37	0
Maine	1	0	2	0	0	-	25	0	10	0	18	0	5	0	2	0	0	-	63	0
Maryland	0	-	1	0	3	0	26	3.8	22	0	187	1.6	410	.5	655	0	2054	0	3358	.2
Massachusetts	1	0	4	0	1	0	30	0	32	0	76	0	257	0	4	0	64	0	469	0
Michigan	0	-	5	0	39	0	2	0	13	0	19	0	4	0	4	0	23	0	109	0
Minnesota	1	0	1	0	2	0	2	0	4	0	1	0	0	-	4	0	0	-	15	0
Mississippi	0	-	0	-	0	-	5	0	4	0	2	0	3	0	3	0	2	0	19	0
Missouri	0	-	5	0	0	-	12	0	8	0	103	0	462	0	10	0	5	0	605	0
Montana	0	-	1	0	0	-	0	-	0	-	0	-	0	-	0	-	0	-	1	0
Nebraska	0	-	1	0	0	-	0	-	1	0	1	0	0	-	0	-	0	-	3	0
Nevada	0	-	0	-	0	-	4	0	1	0	0	-	0	-	0	-	0	-	5	0

New Hampshire	0	-	0	-	0	-	1	0	8	0	6	0	2	0	2	0	4	0	23	0
New Jersey	0	-	0	-	1	0	1464	50.5	7668	57.1	14625	28.1	27287	21.2	25720	18.8	42412	38.3	119177	30.3
New Mexico	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
New York	0	-	10	0	29	0	314	24.5	6692	36.3	11690	19.3	17917	9.7	43961	2.9	26405	5.0	107018	8.5
North Carolina	0	-	0	-	0	-	3	0	3	0	0	-	0	-	0	-	0	-	6	0
North Dakota	0	-	0	-	0	-	4	0	4	0	1	0	0	-	0	-	0	-	9	0
Ohio	61	6.6	363	1.1	144	0	306	.3	180	1.1	727	3.2	1782	0	2767	.04	5050	.06	11380	.3
Oklahoma	0	-	2	0	1	0	0	-	6	0	2	0	3	0	3	0	3	0	20	0
Oregon	0	-	0	-	0	-	0	-	1	0	0	-	1	0	0	-	0	-	2	0
Pennsylvania	2	0	16	0	4	0	47	0	67	0	46	0	373	0	1256	0	2961	.3	4772	.2
Rhode Island	0	-	0	-	0	-	2	0	1	0	30	0	4	0	1	0	0	-	38	0
South Carolina	0	-	0	-	0	-	0	-	1	0	2	0	0	-	0	-	0	-	3	0
South Dakota	0	-	0	-	0	-	0	-	2	0	0	-	0	-	0	-	0	-	2	0
Tennessee	0	-	1	0	0	-	6	0	10	0	43	0	22	0	10	0	96	0	188	0
Texas	0	-	1	0	1	0	2	0	5	0	0	-	5	0	1	0	0	-	15	0
Utah	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
Vermont	0	-	0	-	0	-	2	0	6	0	3	0	3	0	5	0	0	-	19	0
Virginia	1	0	1	0	0	-	11	0	20	5.0	112	2.7	388	.3	346	0	237	0	1116	.4
Washington	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
West Virginia	0	-	3	0	8	0	0	-	5	0	7	0	807	0	1203	.4	2424	.04	4457	.1
Wisconsin	0	-	4	0	6	0	4	0	15	0	6	0	8	0	5	0	11	0	59	0
Wyoming	0	-	0	-	0	-	0	-	1	0	0	-	0	-	0	-	0	-	1	0
District of Columbia	1	0	10	0	7	0	8	0	7	0	11	0	34	0	105	0	100	0	283	0
Canada	0	-	0	-	0	-	1	0	1	0	0	-	0	-	1	0	1	0	4	0
State not recorded	0	-	0	-	0	-	0	-	0	-	0	-	77	0	0	-	0	-	77	0
TOTALS	77	5.2	462	.9	269	0	2447	33.5	16956	40.5	37985	17.1	52288	12.3	87185	7.2	101025	18.0	308694	15.0

E. G. Kelsheimer, L. M. Fenner, C. E. Dike, and Curtis May,
Forest Pathology, Bureau of Plant Industry,
in cooperation with Bureau of Entomology and Plant Quarantine

(Adjustments have been made to include a small proportion of duplicate specimens commonly referred to as "re-collects")

OBSERVATIONS ON THE DEATH OF PEACH TREES IN THE NASHVILLE, ARKANSAS, PEACH DISTRICT IN 1939

John C. Dunegan

In the spring of 1938 peach growers in the Nashville district found that many trees died soon after growth began. The number of dead trees varied from orchard to orchard, some growers reporting losses as high as 50 percent. In one instance 80 percent of the trees in a 10-acre block died by midsummer.

When the trees began to die in the same manner in the spring of 1939 the growers became alarmed over the future of the district, particularly since the losses were largely among the younger plantings. No detailed survey is available but it is estimated that 5 percent (50,000) of the trees in the district are affected.

Although many of the growers were certain that the continued use of mineral-oil-emulsion sprays in the dormant period was the cause of the death of the trees, the symptoms present on the affected trees are characteristic of the type of winter injury so prevalent in the southern peach-growing districts. In typical cases the injury was confined to the trunk and crotch of the tree. The tissues from the epidermis to and including the cambium were dark brown and had a fermented odor. The root system and the parts above the crotch showed no discoloration of the cortical tissues, but the leaves were small and abnormal in color. In trees less seriously affected the injury consisted only of a narrow streak of discolored tissue extending from the soil line toward the crotch. Other trees were found in which the discoloration extended up the scaffold limbs for various distances. In a few cases all the tissues were discolored from the soil line to the tip of the branches.

The growers stated that the Fairs Beauty, a variety introduced from Texas and maturing approximately at midseason, was the one most seriously injured in the district. An examination of orchards confirmed this statement in part, for many blocks of this variety from 4 to 6 years of age showed affected trees. However, equally as serious injury was observed in Early Elberta blocks and dead or dying trees were found in older plantings of Elberta and Early Rose.

The injury to Fairs Beauty is of particular significance because this variety has been planted very extensively during the past 8 years in the Nashville area. It was impossible to decide whether or not the Fairs Beauty was particularly susceptible because there was not sufficient acreage of the other varieties for an adequate comparison.

Trees planted in the thinner soils of the hill tops showed the highest mortality; blocks which produced a heavy crop in 1938 were more seriously affected than those which bore light crops, and the injury appeared to be as severe in orchards with winter cover crops as in those maintained under a system of clean cultivation.

An examination of the weather records[1/] during the past 2 years shows certain very significant temperature fluctuations that are undoubtedly responsible for the injury to the trees. Thus, on January 19, 1938, a maximum temperature of 78° F. was recorded at Highland. The minimum temperatures were also considerably above freezing and the peak of high average temperatures was reached on the 23rd with a maximum of 63° and a minimum of 58°. This period of warm weather was followed by a drop to a maximum of 37° and a minimum of 20° on the 26th. Likewise, during February a maximum of 78° was recorded on the 12th with accompanying minimum temperatures considerably above freezing, to be followed by a drop from a maximum of 70° on the 18th to a maximum of 44° and a minimum of 21° on the 19th.

The maximum temperatures during the first 23 days of November were all above 60°F. with a maximum of 82° on the 2nd and 16th. On November 27 the maximum temperature was 47° and the minimum was 19°. Again in December there was a continuous period of 26 days of warm weather with maximum temperatures between 52° and 74° and with minimum readings above freezing for 21 days. At the end of this period the minimum temperatures dropped abruptly to 18°.

The effect of these temperature fluctuations was aggravated in both years by the prolonged summer and fall drought which preceded them. The growth of the trees was retarded by the dry weather which extended from July until the end of October. When the drought was broken in November many of the trees made a late secondary growth and undoubtedly entered the winter in a weakened condition. Practically all the injured trees examined in 1939 showed evidence of secondary growth while the uninjured trees in most cases showed little evidence of having made a late twig growth the preceding fall.

The conclusion seems inescapable that the combination of the summer drought followed by rain in the late fall and subsequent marked temperature fluctuations are the environmental factors concerned in the

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1/ The figures cited are those recorded at Highland, Arkansas, in the Nashville peach district, and reported in the Arkansas section of Climatological Data, U. S. D. A. Weather Bureau.

widespread injury to peach trees in the Nashville district.

(Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, cooperating with the Arkansas Agricultural Experiment Station).

REPORTS ON THE DEVELOPMENT OF APPLE SCAB

RHODE ISLAND: Leaves from orchards near the coast are strikingly free of perithecia of Venturia inaequalis this spring. Only an occasional leaf is found containing perithecia. Even from poorly sprayed orchards where the leaves have heretofore been filled with perithecia at this time of the year, the fruitbodies are hard to find this year. The leaves are filled with the perithecia of two saprophytic fungi. Old McIntosh leaves from the farthest inland orchards (Wallum Lake) exhibit the old Fusicladium stage lesions and contain abundant perithecia of the Venturia stage. Apparently, in regions near the coast, the high winds and salt spray of the hurricane of last September 21 either killed the conidial stage of the apple scab fungus or rendered the apple leaves an unfavorable substratum for the ascogenous phase of the life cycle.

The first ascospores were shot on May 9 when intermittent showers and heavy fog persisted for 24 hours. About 10 percent of the asci are now empty. (May 14).

Leaf samples, except those from farthest inland (Wallum Lake), continue to show few or no perithecia of Venturia inaequalis. Because of the lack of rainy periods the perithecia present contain from 75 to 95 percent of their total spore production even though petal fall is beginning to take place. With the great amount of foliage surface requiring protection, and the large amount of primary inoculum yet to be discharged, we are apt to have severe apple scab in inland orchards. (May 27). (Frank L. Howard, Rhode Island Agricultural Experiment Station).

NEW YORK: According to reports in various issues of the Weekly News Letter, scab had appeared on apple leaves in most counties by the end of May, but infection so far is light and scattered.

DELAWARE: Apple scab is very spotted in commercial orchards but is generally well under control. The early season up to and including the calyx spray was very favorable for scab development but since that time there has been practically no scab weather. Ascospores have been

discharged since the first cover. (K. J. Kadow, Delaware Agricultural Experiment Station. June 6).

ILLINOIS: A prolonged dry period following the bloom checked what appeared to be the start of a bad apple scab situation. Perithecia remained crowded with ascospores during this period, but at the present time most of them have been discharged. A few heavy showers started extensive discharge but rapid drying of the foliage prevented abundant infection in most orchards. A few cases of severe damage from scab have been reported where unusual local weather conditions prevailed. (H. W. Anderson, University of Illinois. May 24).

NORTHWEST ARKANSAS: Although immature Venturia inaequalis perithecia were found as early as February 13 in the vicinity of Fayetteville mature perithecia were not found until March 28.

The small leaves at the base of the apple blossom buds were infected by the scab fungus on April 5, when a rainfall of 2.03 inches induced ascospore discharge, and sporulating lesions were found on these small leaves 12 days later. Subsequent periods of rainy weather on April 17, 18, 20, 21, and 27 favored the spread of the fungus.

The trees were ready for the cluster bud spray on April 6 but the temperature dropped to 25°F. on that date. Many growers delayed this application until the full effect of the freeze could be ascertained, while others omitted it entirely and did not start their spray applications until April 20, the date of the calyx spray. This procedure allowed the scab fungus to become well established on the leaves and fruit. The weather conditions in May have further aggravated the situation and the disease has reached epiphytotic proportions in many Delicious, Jonathan, Winesap, and Ben Davis blocks. (John C. Dunegan. Cooperative work between the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, and the Arkansas Agricultural Experiment Station).

WISCONSIN: The first ascospore discharge was observed in Dane County on April 25, in Crawford County on April 27. Ascospores were mature in Door County on April 18, but there was no discharge until May 8-9; a heavy discharge occurred May 20-21. The rains of May 7-8-9 were general throughout the State and were followed by a general ascospore discharge. Scab spots were evident on the first leaves and pedicels at Madison on May 21. The development of scab has been delayed because of cool dry conditions. Perithecia were found with no mature ascospores on May 22 in Crawford County, indicating further discharge

still to come. (R. E. Vaughan, Wisconsin Agricultural Experiment Station. May 25)

REPORTS ON FIRE BLIGHT

NEW YORK: (From Weekly News Letter for June 5). According to C. G. Small reporting from Ulster County, "Fire blight [Bacillus amylovorus] can be found in some orchards on the young pear fruits." W. J. Clark reported that "Fire blight is already showing up in Greening and Fall Pippin apples in Rockland County. It was first observed on May 29."

OHIO: Blossom blight and twig blight of apples are being reported from many sections in Ohio. In the southwestern part of the State more damage is reported than in any previous year. (C. C. Allison, Extension Plant Pathologist. May 26).

ILLINOIS: Within the last week fire blight has started to appear on apples in the form of spur blight. No evidence of blight was observed at blossom time or immediately thereafter for a period of at least 10 days. The fact that the apples bloomed heavily and many clusters withered because of frost injury and crowding may account for the overlooking of blight in the early stages. This threatens to be a very serious epidemic since numerous growers have reported almost total loss of their crops. (H. W. Anderson, University of Illinois. May 24).

WISCONSIN: Active cankers were found at Gays Mills, Crawford County, on May 18, in condition indicating their activity for a week or 10 days. The weather has not favored rapid infection because of lack of rain. (R. E. Vaughan, Wisconsin Agricultural Experiment Station. May 25).

NOTES ON THE CEDAR RUSTS

MASSACHUSETTS: Data have been gathered on the appearance of matured horns emerging from the galls of Gymnosporangium juniperi-virginianae on cedars. In 1939, the first mature spore horns bearing teliospores appeared on May 20, following rain. The second "wave" and a revival of dried spore horns occurred on May 27. The average date for the appearance of the spore horns at Amherst is about April 15. The earliest date recorded during the last 15 years was April 8. It is evident that the appearance of this rust this spring is nearly 5 weeks later than usual. In some years the last wave of teliospore horns oc-

curs during the last week in May. (W. H. Davis, Massachusetts Agricultural Experiment Station. May 28).

NEW YORK: Lesions of apple rust have been reported on apple leaves (in Weekly News Letter, various issues).

ILLINOIS: The galls of Gymnosporangium juniperi-virginianae are more abundant than usual on the cedars. The horns have expanded during the past two weeks but the rainy periods have been of short duration. Quince rust, G. clavipes, has been observed on cedars in nursery rows and to some extent on wild cedars. One nursery in southern Illinois has a 100 percent infection of this rust on trees originally obtained from wild trees in Kentucky. (H. W. Anderson, University of Illinois. May 24).

WISCONSIN: Red cedars in Crawford County have been full of Gymnosporangium juniperi-virginianae galls, with horns extended during rains of May 7-8. (R. E. Vaughan, Wisconsin Agricultural Experiment Station. May 25).

REPORTS ON PEACH DISEASES

LEAF CURL AND PHOMA DISEASE IN DELAWARE: The weather was very wet and relatively warm shortly before the buds opened this year. This fact undoubtedly is the reason that peach leaf curl [Taphrina deformans] has been so serious. Sprays applied any time after the buds began to swell this spring failed to control leaf curl satisfactorily. Also, growers who used concentrations of copper sulfate less than 5-5-100 did not get complete control. In experimental plots 6-6-100 was required for perfect control. This evidently has been one of the worst leaf curl years in Delaware for quite some time.

Two peach orchards in the State have a rather large infection of Phoma persicae on twigs and branches. Dr. Roberts spent a day in Delaware with me recently, and he was of the opinion that the fungus was of secondary importance and that the tree vigor had been lowered prior to infection from some other cause. Whatever the actual answer to the problem, the fungus is certainly causing considerable damage in these two orchards. (K. J. Kadow, Delaware Agricultural Experiment Station. June 6).

LEAF CURL AND BACTERIAL SPOT IN ILLINOIS: Peach leaf curl is more general and severe than was anticipated earlier in the season. While not serious in commercial orchards, it is very common in farm orchards and on escapes. A few commercial orchards show enough to cause

some injury.

The first leaf infections of bacterial spot [Bacterium pruni], all of which could be traced to "spring cankers", appeared at Olney on April 28. On May 8, abundant leaf infection in the neighborhood of spring cankers was observed at Carbondale. To date, the infections have not appeared beyond the areas in the immediate neighborhood of the spring cankers. (H. W. Anderson, University of Illinois. May 24).

REPORTS ON DISEASES OF CHERRY

BACTERIAL GUMMOSIS ON SWEET CHERRY TREES IN NEW YORK: The occurrence of bacterial gummosis [Bacterium cerasi] on sweet cherry trees in Columbia and Wayne Counties is reported in the Weekly News Letter for May 29 and June 5, respectively. In the former county, according to S. R. Shapley, "Bacterial gummosis is taking rather a heavy toll among young sweet cherries and there is even considerable die-back on smaller branches in some of the older trees. Windsors in some orchards have suffered more this past winter than Schmidts. The cankers still appear active." Morton Adams reported that the disease was noticed on 3 sweet cherry trees in Wayne County.

CHERRY LEAF SPOT IN NEW YORK: In the Hudson Valley the maturation of ascospores of the cherry leaf spot fungus, Coccomyces hiemalis, has been delayed by lack of rain and at the present time less than 1 percent of the asci appear to contain mature spores capable of discharging. (D. H. Palmiter, May 19. In Weekly News Letter, May 22).

LEAF SPOT IN WISCONSIN: Ascospores were mature by May 20 in Door County, when a very light spore discharge occurred. Dry weather has delayed development. Cherry trees were in full bloom May 22. (R. E. Vaughan, Wisconsin Agricultural Experiment Station. May 25).

OTHER REPORTS ON FRUIT DISEASES

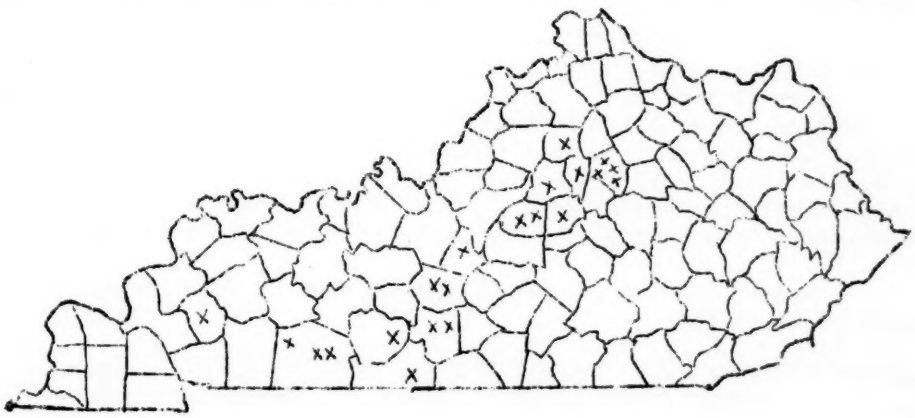
BLACK-ROT LEAF SPOT ON APPLE IN DELAWARE: Black-rot leaf infection of apples (frog-eye) [Physalospora obtusa] has been extremely bad on some varieties. Williams has been outstanding in this connection. The spotting was noticeable on the leaves at the time they emerged from the buds. (K. J. Kadow, Delaware Agricultural Experiment Station. June 6).

RED-CORE DISEASE OF STRAWBERRY IN DELAWARE: Red core [Phytophthora sp.] was very damaging, causing complete losses in some instances. We have located infected patches fairly well, and are destroying them. I believe this problem should be of less importance next year. (K. J. Kadow, Delaware Agricultural Experiment Station. June 6).

ORANGE RUST ON WILD BLACKBERRIES IN ILLINOIS: Orange rust [Gymnoconia peckiana] is again very prevalent on wild blackberries throughout the State. The 1938 heavy infection probably accounts for the continued severity of this disease. (H. W. Anderson, University of Illinois. May 24).

SOME REPORTS ON DISEASES OF TOBACCO

IN KENTUCKY BLUE MOLD APPEARS FIRST IN OLD PLANT BEDS: Blue mold (Peronospora tabacina) has been found in old plant beds in the counties indicated on the accompanying map, but none has been reported in beds in new sites up to the present except in the counties on the southern border



Counties in Kentucky where blue mold was observed first in tobacco plant beds on old sites.

or in adjacent counties. It seems very clear that the disease this year originated in plant beds which were used both in 1938 and 1939, and that the use of new plant-bed sites each year will give control except when early and severe outbreaks occur to the south and an abundance of spores are blown into the State early in the year. (W. D. Valleau, Kentucky Agricultural Experiment Station. June 1)

DESTRUCTIVE EPIDEMIC OF BACTERIAL LEAF SPOTS IN KENTUCKY: A survey was made for diseases in tobacco beds in Western Kentucky from April 3 when the plants were just coming up until June 1 when most of of the crop had been set. Temperatures were low in April (below freezing several nights) and in early May. Cold injury was present and conspicuous in most beds and the plants made poor growth until about the middle of May. Setting was delayed about 10 days because of the cold, wet spring.

Angular leaf spot [Bacterium angulatum] was first observed on Arpil 21 and wildfire [B. tabacum] on April 25. Soon after this both wildfire and angular leaf spot apoeared in many beds that did not receive liquid Bordeaux treatments. Both diseases, especially wildfire, were destructive. Some beds were seen in which up to 75 percent of the plants were destroyed by the wet-rot stage. Because of nowspaper descriptions of the destructiveness of blue mold most growers believed this bacterial leaf spot epidemic to be blue mold. Blue mold, however, did not appear in this area until May 7 and then only in beds used in 1938. Blue mold appeared in new beds on one farm on May 14, but did not become general in this area until about May 23. At this time plants were large enough to set and temperatures were so high that no damage resulted. After May 23 few beds were seen that were free of blue mold, but usually only small areas of the beds were affected and recovery was rapid. Many growers were through setting before blue mold appeared. Most farmers either did not recognize it or if they did they ignored it. The blue mold epidemic in this area was markedly less severe than in the severe outbreak of 1938. This year blue mold caused no delay in setting. Wildfire caused more loss in each of several beds than was observed for blue mold in the entire area where this study was made.

A summary of the survey of tobacco beds in Todd, Logan, and neighboring counties follows:

Tobacco type	Bordeaux treatment used			No treatment used		
	Wildfire	Angular Leaf spot	Total beds observed	Wildfire	Angular Leaf spot	Total beds observed
Dark fired	0	0	111	23	16	71
One Sucker	0	0	30	17	7	49
Burley	*1	*1	66	39	63	159
Totals	1	1	207	79	86	279

* Disease present in bed when treated

This tabulation indicates not only the distribution of wildfire

and angular leaf spot in the beds but the extent to which Bordeaux treatment was used in this area, and its effectiveness. (E.M. Johnson, Kentucky Agricultural Experiment Station)

SUN SCALD OR SUN BURN ON TOBACCO IN NORTH CAROLINA: Sun scald has been very prevalent and has caused considerable injury to tobacco in many fields of Robeson County during the past 2 weeks. This injury has been much more prevalent and the damage resulting from it much more severe on the lighter sandy soils; however, it has not been confined strictly to these soil types.

Several days of dry weather occurred prior to June 2, consequently the tobacco grew rather slowly. A rather general rain fell the night of June 2, which stimulated the growth of tobacco remarkably, and the leaves were very turgid for several days. The temperature suddenly changed from a high of 85° F. on June 5 to a high of 91° on June 6. The highest temperature for the next 4 days was 92° or above. As a result of the combination of these 2 factors, abundant water and excessive temperatures; much sun scald or sun burn occurred. (O. P. Owens, Assistant County Agent, Lumberton, North Carolina.. June 13).

COTTON SEED TREATMENT EFFECTIVE IN ARKANSAS THIS YEAR

V. H. Young

Cotton seed treatment with 2 percent Ceresan is proving of great benefit this year in eastern Arkansas. At the Cotton Branch Experiment Station at Marianna, Mr. C. J. Byrd, Assistant Director in Charge, states "I am quite confident that we would have had to plant over at least 90 percent of our first planting if the seed had not been treated." "Counts indicate that nearly twice as many plants have emerged on treated rows as on non-treated rows. Examination of plants removed in thinning indicates that there are at least 5 times as many soreshin lesions on plants from non-treated rows as from rows where seed was treated."

The weather was comparatively dry early in the spring but since May 1 it has been rainy and until recently quite cool. There seems little doubt that seed treatment will prove highly beneficial to yields of cotton this year.

(Arkansas Agricultural Experiment Station, May 27).

PASMO DISEASE OF FLAX IN THE LOWER RIO GRANDE VALLEY OF TEXAS

G. H. Godfrey and Herbert Rich

With the present program of cotton acreage reduction, substitute crops are being sought for the Lower Rio Grande Valley of Texas. One of these, flax, was planted in a small way last year; and this year, for the first time, in a commercial acreage, with a total of nearly 4,000 acres.

On the Lower Valley Experiment Station Farm, in an experimental variety planting[1/], pasmo disease (Phlyctaena linicola) [Sphaerella linorum Wollenweber] appeared to a striking degree. It was noted that there was a marked difference in the incidence of the disease on different varieties. Notes were taken on relative degree of severity of the disease on the different varieties, on April 24, 1939, after the seed was well formed but while there were still some leaves on the plants. The notes were taken purely on the basis of abundance of stem lesions, occasional leaf infections being ignored. The scale of disease incidence was arbitrarily ranked from 0 to 5, 1 being very slight; 2, slight; 3, medium; 4, severe; and 5, very severe. The very slightly affected plants had only one or two lesions on the stem; those very severely affected had the stems more than half covered, with some lesions entirely surrounding the stem and a severe effect on fruiting. Five different lots of 20 stems each were cut from 5 randomly selected spots along the row, for each variety. Each stem was ranked separately, then each rank was multiplied by the number of stems in that rank and the total figure for all was divided by 100 to determine the placing of the variety. The results with the variety Punjab are given by way of illustration of the method:

Variety	Number of stems in severity rank: 0	1	2	3	4	5
Punjab	10	28	20	11	13	19
Product (Number of stems X corresponding severity rank)	0	28	40	33	52	95
Total (Sum of products)						248
Rating (Total ÷ 100)						2.48

The rating of Punjab then is 2.48 or an average of a low medium infec-

1/ Varietal plots of the Texas Agricultural Experiment Station in cooperation with the Division of Cereal Crops and Diseases, U. S. Bureau of Plant Industry.

tion (with perhaps 25 percent loss).

The rating, by varieties, of the station plantings was as follows, in order of apparently increasing susceptibility:

1. Bolley Golden	0.00	7. Argentine	1.36
2. Buda	0.08	8. Abyssinian yellow	1.44
3. Rio (treated seed)	0.20	9. Linota	1.53
4. ND 114	0.98	10. Redwing	2.28
5. Bison	1.06	11. Giza	2.31
6. Rio (not treated)	1.34	12. Punjab	2.48

The variety Bolley Golden had no stem lesions, but showed considerable leaf infection.

(Texas Substation No. 15, Weslaco, Texas).

OBSERVATIONS ON FLAX DISEASES IN TEXAS

A. C. Dillman

As flax is a new crop of much promise in south Texas, where it is grown as a fall-sown crop, it may be opportune to note the principal diseases that have been observed by the writer, or reported to him by other workers.

Experiments with flax were conducted by the Division of Cereal Crops and Diseases at the San Antonio Field Station almost continously for a period of 20 years, from 1915 to 1934, during which time some 300 or more lots of seed, representing numerous strains and varieties, were grown. It is noteworthy that during this time no common diseases of flax were observed. A possible explanation of this freedom from diseases may be that: (1) The seed was stored in the laboratory at Washington, D. C., for a long period, probably a year or longer, before it was sown, and (2) the seed was thoroughly cleaned, being free from bits of stems and trash.

The only disease observed on flax at San Antonio was cotton root-rot. In a letter of November 10, 1932, George Ratliffe, Superintendent, wrote the writer as follows:

"For the first time on record flax plants were found dying [about May 1, 1932] as the result of an attack by the cotton root-rot fungus, Phymatotrichum omnivorum. Although 5 separate plots were definitely located, the disease was not a factor in decrease of yields, as only a few plants were killed in each location. No other plant diseases were observed."

Although the cotton root-rot fungus was widely distributed on the San Antonio Field Station, it was never observed on flax roots except this one time. As flax is fall-sown and matures before the warm weather of early summer, it is able to escape severe infection from the cotton root-rot fungus.

During the past 5 seasons, 1934-35 to 1939, varietal experiments, including the important commercial varieties of flax, have been carried on at Beeville, College Station, Angleton, Victoria, Orange Grove, Winterhaven, and Weslaco, Texas. These experiments are conducted by the Texas Agricultural Experiment Station through informal cooperation with the Division of Cereal Crops and Diseases. In April 1938, and again in 1939, the writer visited the several stations for the purpose of taking agronomic notes on flax varieties. At Beeville (April 28, 1938) no rust was found in the flax nursery but rust was very prevalent in an increase-plot of Bison flax sown with seed from a different source. At Angleton (April 30, 1938) pasmo (Phlyctaena linicola Speg.) was found in 5 or 6 areas in plots of the varieties Giza (C.I. 378) and Rio (C.I. 280). It was found also on Abyssinia Yellow (C.I. 367), Punjab (C.I. 20), and Bolley Golden (C.I. 644), whereas Redwing, Linota, and Bison appeared to be nearly free, only a trace of infection being found. At College Station (May 1, 1938) pasmo was very prevalent on Giza, and less prevalent on an adjacent plot of Bison.

It is of interest to note that in 1938 the nursery plots observed at Beeville apparently were free of rust (Melampsora lini), whereas an increase-plot of Bison, sown with seed from a northern source, was badly infected. On the other hand, a field of 70 acres at Liberty, sown with northern-grown seed, was apparently free from rust. In 1939 somewhat over 15,000 acres of Bison flax were grown in south Texas, and rust was more or less prevalent in nearly all fields. One farmer reported that rust appeared first at the end of the field where flaxseed was dropped on the surface of the soil in filling the drill box with seed. However, in fields observed by the writer, rust was well distributed throughout the fields. It seems certain that rust will be a serious factor on Bison flax in south Texas, as volunteer flax from fields harvested in early May can easily persist until planting time in October or November. Fortunately, the Rio and Punjab varieties are resistant to or immune from rust, and other promising rust-resistant varieties are being tested to determine their adaptation to Texas conditions.

Flax wilt, Fusarium lini Bolley, has not yet been observed by the writer under Texas conditions. Flax is a new crop in the State and wilt rarely appears until succesive crops of flax have been grown on the same soil.

(Division of Cereal Crops and Diseases.)

CEREAL DISEASES IN NEW YORK

Karl D. Butler

Leaf rust of wheat, caused by Puccinia rubigo-vera tritici, was found to overwinter on leaves of fall-sown wheat during the past winter. Plants removed from the field to the greenhouse throughout the winter definitely established this fact. On April 1, leaf rust uredia were still present on some of the lower leaves in the field. Urediospores thus obtained were capable of producing infection upon inoculation. By April 15, there was a slight increase in uredia on the lower leaves. On May 3 and 4 uredia were found on lower leaves in 25 out of 26 fields examined in Seneca, Ontario, Monroe, Orleans, and Tompkins Counties. Rust infections increased slightly in certain areas until about May 10 to 11, after which many of the infected leaves died as a result of prolonged dry cool weather. As a result, by May 26, very few uredia could be found. Some inoculations had already taken place, however, and a few new pustules are now developing.

Stem rust [P. graminis] urediospores were found to be viable on December 5, but there were no pustules with viable spores by January 12. Infections on barberry were first found May 16 at Ithaca, but as yet only a few mature aecia have been observed. Such infections are still sparse.

Erysiphe graminis tritici was severe early in the season and probably overwintered in situ.

The first infections of Puccinia coronata were observed on Rhamnus May 19. No mature aecia have been found as yet.

Erysiphe graminis hordei overwintered on winter barley and has been fairly severe in some localities. Barley leaf rust, P. anomala, was first observed May 6 at Ithaca on winter barley, where it appears to have overwintered.

Puccinia rubigo-vera secalis also overwintered on rye. This rust was rather severe on lower leaves from about April 15 to May 11, but is not very prevalent at present.

(Cornell University. May 29).

BRIEF NOTES ON CEREAL DISEASES

LEAF RUST ON WHEAT IN KENTUCKY: Rust is reported as being unusually severe on wheat in the western part of the State. At Lexington it started early but has not developed rapidly. (W. D. Valleau, Kentucky Agricultural Experiment Station. May 31).

WHEAT DISEASES IN OKLAHOMA: Stem rust has appeared in small amounts in Oklahoma. It was first found in Stillwater on May 26 and in one case secondary infection was evident. We have received reports of its occurrence near Bison and Hennessey nearly 2 weeks ago.

The most striking feature of the cereal disease situation at the present time appears to be the unusually high percentage of loose smut [Ustilago tritici] in wheat, with fields frequently showing 15 to 20 percent or more. This is evidently correlated with the excessive rainfall at heading time last year. Bunt [Tilletia spp.] is quite limited in amount.

At this time leaf rust has become very abundant but as the wheat is rapidly approaching maturity there is no indication that the injury from leaf rust will be greater that that of a normal year. (K. Starr Chester, Oklahoma Agricultural and Mechanical College. May 27).

WHEAT DISEASES IN KANSAS: Heavy showers in central and eastern Kansas and a good rain in southwestern counties have helped the winter wheat crop, which has been deteriorating since the middle of April. The moisture also is very favorable for the development of rust. So far there is only a light, but rather general, infection of leaf rust in the eastern half of the State, and the occurrence of stem rust has not been reported.

Wheat is fairly well headed in southern counties and many fields look excellent. Loose smut of wheat is even more abundant than it was last year. Apparently the very early varieties such as Early Blackhull are the most heavily infected. It now seems clear that loose smut has steadily increased in Kansas in recent years and now has reached serious proportions. Experimental plantings at Manhattan are all full of loose smut.

Mildew and Septoria also are prevalent in the rust nursery at Manhattan but are not much in evidence elsewhere. (C. O. Johnston, May 20. Cereal Courier 31: 57. May 25).

BACTERIAL RING ROT OF POTATOES IN KERN COUNTY, CALIFORNIA

P. A. Ark and E. W. Bodine

A bacterial ring rot of potatoes caused by Phytomonas sepedonica (Spieck. u. Kolthoff) Bergey et al. was found in California in potatoes grown in San Joaquin County in 1938[1/]. This year it appeared in severe form in Kern County, one of the largest areas in the State for early shipping potatoes. In the field, both top and tuber symptoms were observed in diseased plants.

In early stages of the disease a slight wilting of leaflets, similar to tomatoes affected with Phytomonas michiganense, is indicative of the disease. At this stage of the disease the tubers may show a very light creamy yellow discoloration in the vascular ring of the stem end which does not spread very far down. In more advanced stages, small cracks appear around the stem end, which upon cutting shows necrotic cavities of cheesy appearance and consistency. The softness of infected tubers increases with increased activity of various saprophytic bacteria which follow Ph. sepedonica. The leaves of infected plants are wilted, with necrotic margins curved downward, while the main stems remain erect. It is believed that this disease is the precursor of the bacterial soft rot which has caused heavy losses.

Many fields at Shafter showed a large amount of this disease, infection in some cases reaching 100 percent.

(University of California, Division of Plant Pathology).

PLANT DISEASES IN SOUTHERN CALIFORNIA

H. G. Mac Millan and O. A. Plunkett

In the neighborhood of Guadalupe downy mildew (Peronospora schachtii) is causing up to 25 percent loss in individual fields of sugar beet.

Black leaf spot (Alternaria brassicae) was observed on cauliflower at Arroyo Grande. The damage was not estimated but the disease was not severe.

Leaf spot of the globe artichoke, caused by Ramularia cynarae Sacc., caused extensive leaf spotting at Arroyo Grande. The season

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1/ Ark, P. A. Bacterial ring rot of potatoes in California. Plant Disease Reporter 23 (7): 125. 1939.

for this crop is over, so the economic loss is not estimated. Apparently this fungus has not heretofore been reported in the United States.

Leaf blight (Cercospora carotae) of carrot was also observed at Arroyo Grande. Its distribution was spotted and appears to be related to seed sources. The disease will cause no loss, as the carrots will be used for juice. Carrot mosaic was also present but causing no loss.

Downy mildew (Bremia lactucae) was noted at Oxnard in lettuce fields which have passed their prime. Drop (Sclerotinia sp.) was scattered on old lettuce.

Infection of lima beans in the coast region with Fusarium sp. causing root rot is general, but the loss cannot be estimated now as the plants are young.

Root rot of peas caused by Fusarium sp. is very common in Santa Barbara County and causing considerable loss, up to 100 percent in some fields.

Early blight (Alternaria solani) is common in individual potato fields at Santa Maria. The damage is estimated at 20 percent. Infection appears to be in advance of the customary time, considering the stage of maturity of the host.

Stem rot (Corticium vagum) is very common in fields where potatoes are a volunteer crop.

In Santa Barbara County, rust (Cronartium coleosporioides) is common in plantings of the bishop pine, Pinus muricata, where the stand is thick.

(Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, and University of California at Los Angeles).

BRIEF NOTES ON PLANT DISEASES

POTATO BLACKLEG IN KENTUCKY: Seed piece rot and blackleg (Bacillus carotovorus) are quite prevalent in the State. The season was wet during and folbwing planting. (W. D. Valleau, Kentucky Agricultural Experiment Station. May 31).

A CORRECTION: Barley stripe is, of course, caused by Helminthosporium gramineum, not H. sativum as given on page 174 of the preceding issue.

MAY WEATHER

(From U. S. Dept. Agr. Weather Bureau, Weekly Weather and Crop Bulletin from week ending June 6).

May, in general, was characterized by abnormally high temperatures and scanty rainfall. Figure 1 shows the temperature for the month averaged slightly below normal in a limited southeastern area, the lower Mississippi Valley and the Northeast. Elsewhere the monthly averages were above normal, decidedly so in the lower Lake region and northern Ohio Valley, and rather generally from the upper Mississippi Valley and Great Plains westward. The greatest plus departures from normal occurred in the upper Mississippi Valley and in the Cantral and Northern States from the Great Plains westward where the monthly means were mostly from 5° to 9° above normal.

Figure 2 shows that while precipitation was scanty in most areas, some sections had decidedly above normal; the amounts were very unevenly distributed geographically. The relatively driest areas are shown for the Middle Atlantic States, the Ohio Valley, the upper Mississippi Valley, much of the Great Plains, a considerable southwestern area from western Texas westward to the Pacific Ocean, and the interior of the Pacific Northwest. Scattered stations in these areas reported less than 25 percent of the monthly normal. The uneven distribution of May rainfall is indicated by the difference in amounts at Huron, S. Dak., and nearby Moorhead, Minn., the former having 124 percent of normal, and the latter only 18 percent. Also, Fresno, Calif., had 5 percent of normal, and Redding, Calif., 229 percent.

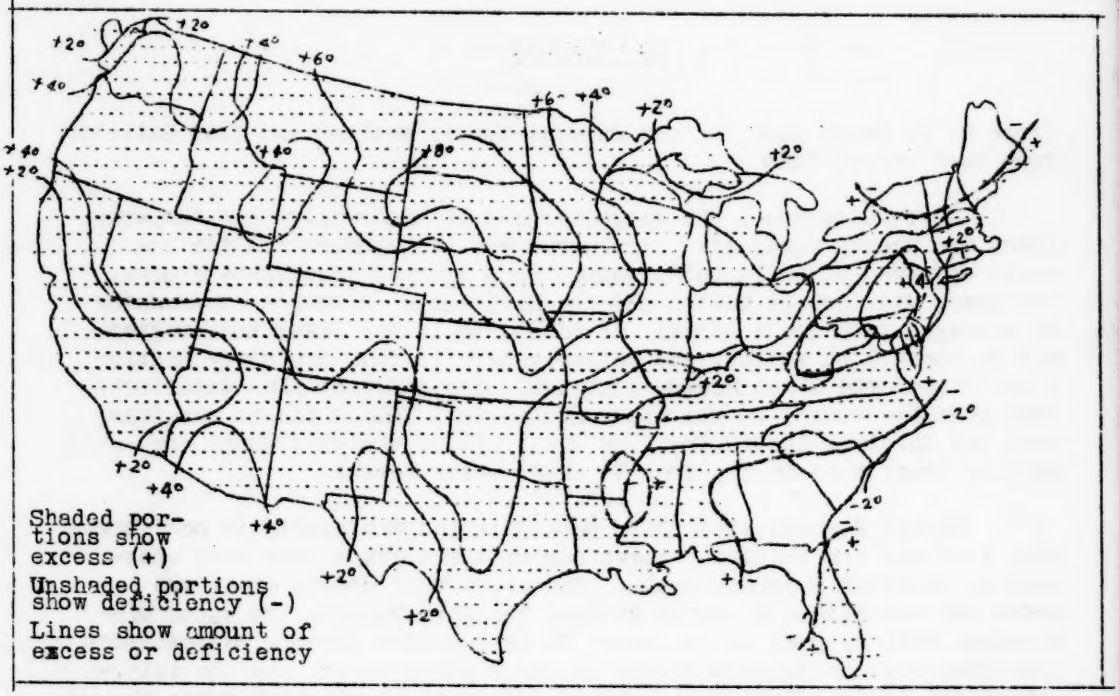

Figure 1. Departure of mean temperature from the normal for May 1939

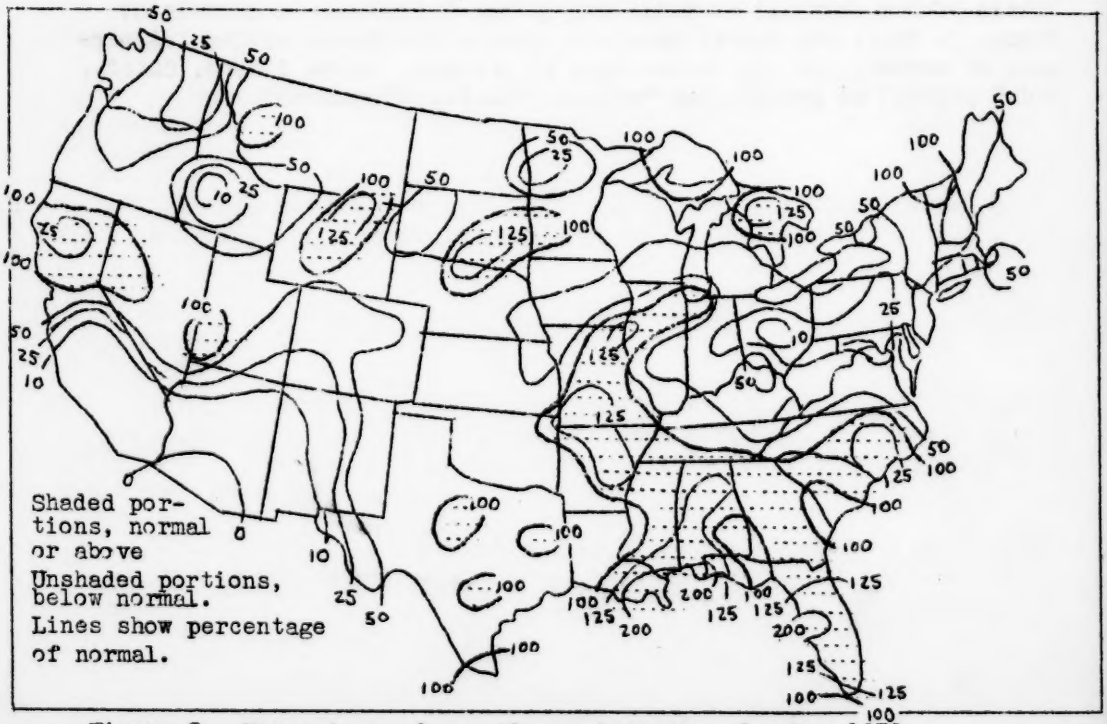

Figure 2. Percentage of normal precipitation for May 1939